LOCKHEED AIRCRAFT CORPORATION: CAST STUDIES IN MANAGEMENT

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NAVAL POSTGRADUATE SCHOOL
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THESIS

LOCKHEED AIRCRAFT CORPORATION

Case Studies in Management

by

Landon G. Cox, Jr.

June 1974

Thesis Advisor: Leslie Darbyshire

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) LOCKHEED AIRCRAFT CORPORATION Case Studies in Management		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis; June 1974 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Landon G. Cox, Jr.		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		12. REPORT DATE June 1974 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) Naval Postgraduate School Monterey, California 93940		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

1. Lockheed
2. Management
3. JetStar

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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S/N 0102-014-6601 |
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Information for writing the cases was obtained from periodicals in the public domain which were published during the period relevant to each case. For this reason, some of the financial figures may be in error in the light of information published at a later date. No attempt was made by the author to reconcile any such errors in financial data. Rather, the estimates made of losses, costs and profits are those which were published in the public domain at the time of the case.

LOCKHEED AIRCRAFT CORPORATION

Case Studies in Management

by

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Lieutenant Commander, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 1974

ABSTRACT

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TABLE OF CONTENTS

I. INTRODUCTION

In May 1971, legislation which came to be known as the Emergency Loan Guarantee Act was introduced before Congress. Although the avowed purpose of this legislation was to provide federal guarantees for loans to major U. S. corporations experiencing serious financial difficulties, it was widely believed to be specifically directed toward the financial rescue of the nation's number one defense contractor, Lockheed Aircraft Corporation, from the brink of bankruptcy. Published information on the operations of Lockheed over the two preceding decades provides an abundance of material through which the decline of this industrial giant from industry leader in the early 1950s to near bankruptcy in the 1970s may be traced.

This paper consists of three case studies which provide information for the analysis of Lockheed management personnel and some specific decisions made by Lockheed management during the 1950s and 1960s. The cases are not, nor were they intended to be, purely financial in nature. Rather, the cases lend themselves to analysis by anyone interested in management and the difficulty of making decisions which may well affect the lives and fortunes of literally thousands of people. The cases are a direct result of interest by Professor Leslie Darbyshire, who requested student assistance in the preparation of case materials which could

be utilized in the various phases of the Management curriculum at the Naval Postgraduate School.

Having chosen Lockheed Aircraft Corporation as his subject, Professor Darbyshire spent several months of his time devoted to library research of information in the public domain. He compiled as much data as possible, from as many sources as were available, on the operations of Lockheed since 1957. In December 1973, the author accepted Professor Darbyshire's offer to sponsor development of the Lockheed cases as a thesis project along with two other students. Additional library research was conducted to augment that already completed by Professor Darbyshire.

All information contained in the cases was obtained from readily available periodicals in the public domain. No conclusions on their informational authenticity have been made by the author. Specific references to footnotes have been eliminated to facilitate classroom use of the cases.

II. DECISION AT LOCKHEED

(Case #1)

During the first two quarters of calendar year 1960, the Lockheed Aircraft Corporation and its corporate head, Mr. Robert E. Gross, were faced with an unexpected - and substantial - financial problem. Various alternatives for its solution were under consideration. At first estimate, the company stood to lose $24.5 million on its turboprop powered commercial aircraft, the Electra. This aircraft had recently been involved in two major crashes resulting in the loss of 97 lives. Preliminary investigation into the cause of these accidents revealed that structural failure of the aircraft's wings was involved. The 13 commercial airlines operating 136 Electra aircraft were justifiably concerned about the safety of Lockheed's product and the advisability of continued future operation of the large passenger plane. Additionally, public confidence in the Electra as a desired mode of travel appeared to be waning, with a resultant loss of passengers and revenue to the airlines.

Following in-depth testing and evaluation by Lockheed engineers, the probable cause of the fatal structural failures of Electra wings was determined. Pending concurrence with the Lockheed findings by the Federal Aviation Administration, the company was prepared to make structural modifications to all Electra aircraft at an estimated cost

to the company of $12 million. During the period of investigation by Lockheed, the Federal Aviation Administration had placed speed restrictions upon the aircraft which were continuing in service with the airlines. (See Exhibit 3 for breakdown of Electra losses.)

To add to the financial troubles caused by the Electra, cutbacks in spending by the Department of Defense promised to heap another $43 million in losses upon the company. These losses could be traced principally to the small executive transport program - the CL-329 JetStar. The history of the JetStar began in 1956 when the Air Materiel Command of the U. S. Air Force issued a design proposal for an 8-10 passenger turbojet transport to be developed at industry expense. The proposal was issued to 28 companies but only eight companies were seriously in contention for approval of their design. Lockheed, as one of the eight contenders, was the first to produce a flyable prototype. The first flight of a JetStar occurred in September 1957, just 241 days following design finalization. Phase Two testing by the Air Force commenced in February 1958, with JetStar production underway at Lockheed's Marietta, Georgia, plant the following November. In October 1959, Lockheed was officially announced as the winner of the development competition and five aircraft were ordered by the Air Force in June 1960. These initial five aircraft were to be utilized in the flight checking and verification of aids to navigation within the Air Traffic Control System. At the time of its initial interest in the program, the USAF proposed to purchase an estimated 300

JetStars. However, informal estimates of the number of aircraft to be sold to the Air Force ranged as high as 1000 to 1500. Three hundred JetStars constituted the estimated break-even point for Lockheed, and additional sales within the general aviation and corporate business markets were expected to provide the company with a substantial profit on the program.

However, the anticipated sales of JetStars to the Air Force did not materialize; and increased competition from other producers of executive transport aircraft reduced Lockheed's potential share of the commercial market. By fiscal year 1963, Congress had authorized the expenditure of $55.2 million by the Air Force for JetStars; but the service had obligated only $30.8 million for the acquisition of 16 aircraft. Congressional pressure against the acquisition of plush executive aircraft to transport military brass was certainly a factor in the reduction of the number of aircraft purchased.

As a result of the aforementioned reversals, investor confidence in Lockheed slipped and was reflected on Wall Street by a plunge in the price of Lockheed common stock from a high of 32-7/8 to a low of 18-7/8 with continued decline forecast. However, in the opinion of Mr. Gross, not everything at Lockheed was gloomy. As evidence of brighter days ahead, he offered news of several promising developments in other Lockheed programs whose profits, when realized, should more than offset the losses and restore the

company to financial health.

The Lockheed-produced Polaris Ballistic Missile recently had demonstrated its reliability during a successful test firing from a submerged submarine at the Atlantic Missile Range. In addition to the sales of this system to the United States, there existed considerable discussion of, and support for, the inclusion of Polaris in the North Atlantic Treaty Organization (NATO) arsenal. If this plan was adopted, the increased market for Polaris Missiles and associated hardware would certainly add to corporate profits and somewhat offset the losses currently envisioned in connection with the Electra and JetStar programs. In addition to Polaris, Lockheed was actively involved in the burgeoning "race for space," being the prime contractor for the Midas Orbital Satellite and a major subcontractor on the Samos Global Surveillance System project. To add to these projects, Lockheed was engaged in important research and development efforts to produce a nuclear engine for use in future aircraft and space vehicles.

On the more tangible side, Lockheed had existing contracts with U. S. allies in amounts totalling $2.3 billion over the succeeding five years for production of the Lockheed tactical fighter aircraft, the F-104 StarFighter. Of the $2.3 billion in expected sales' revenue from the StarFighter program, $608 million in profits were forecast by Lockheed.

The immediate problem facing Mr. Gross and Lockheed concerned the losses expected to accrue during the present and succeeding years and certain costs which had been deferred during previous years. At the heart of the problem was a decision on how to account for these items in the financial records of the company. The losses and costs on the Electra and JetStar programs have been discussed above. In addition to these, Lockheed faced considerable losses and costs from several other programs.

The supersonic transport program had ceased to exist after being dealt a mortal blow in Congress. According to Lockheed, $1.2 million in research and development costs for the SST were still being deferred and being carried as an asset. Since the program on which these costs were incurred was no longer in existence, these costs had to be written off. Likewise, the stretched version of the C-130 Hercules (the Super Hercules) had ceased to be a promising venture. In the case of this program, $788,000 expended in research and development was to be written off. Loss in the market value of 21 used aircraft either in the Lockheed inventory or contracted for required an inventory write down of $3.1 million. The disallowance of costs on several government contracts, refunds required by the renegotiation of contracts, and income tax liabilities totalled $6.9 million. The total amount being considered for write offs, write downs and adjustments came to $150 million before taxes. (The after-tax bill was approximately $67.5 million.)

In the opinion of Lockheed management, there existed two alternatives. In the words of one source:

> "Gross could minimize the losses by the usual method of spreading them over several years, or he could do what plane manufacturers had rarely done - write them all off at once".

It was felt by many analysts that to make a huge write off in a single operating year would unnecessarily jeopardize investor confidence in the firm. When asked by analysts whether Lockheed accounting would be approved by the Internal Revenue Service for tax purposes (Lockheed planned to write off in 1960 some of the Electra modification costs which would be incurred in 1961), Mr. Gross replied:

> "This, of course, is a great hazard. We relied on the advice of our tax counsel, who has been with us for 20 years, and our external auditors. We have an opinion from each - strangely enough in conformity - that they feel it will be accepted."*

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*The regulations governing federal tax write offs allow a corporation to charge development and modification costs and losses in the market value of the company's products against current expenses. If, as a result of this action, the firm experiences a net operating loss for the year, it can claim its loss of profits from the government in the form of a cash refund of its three previous years federal income taxes starting with the third previous year, then to the second and finally to the last year. If this is not sufficient to cover its losses, the company may elect to offset future earnings for a period of up to five years.

QUESTIONS:

1. If Lockheed chooses to write off the costs incurred for research and development, should all such costs, both past and present, be written off at the same time?

2. Should Lockheed write off its losses for financial reporting purposes only; for tax purposes only; or for both purposes?

3. Should Lockheed continue to defer research and development costs as a corporate policy or should the firm adopt the policy of expensing research and development costs as they occur?

4. What are the possible ramifications, both internal and external to Lockheed, of the course(s) of action you have elected in answering the above questions?

EXHIBIT 1

COMPARATIVE INCOME STATEMENTS
LOCKHEED CORPORATION
As of December 1
($ Million)

	1959	1958	1957
Net Sales	1301.6	962.7	868.3
Cost of Sales	1183.6	830.3	735.1
R & D Costs	15.1	17.9	25.6
Retirement Plan Expense	12.9	10.6	10.5
Administration	60.6	51.8	51.4
Depreciation	13.1	12.1	10.7
Net Earnings	16.3	39.7	34.8
Other Income	6.4	3.4	3.3
Total Income (BT)	22.7	43.1	38.1
Interest Expense	5.3	5.1	4.7
Tax	8.7	19.5	17.1
NET INCOME (AT)	8.7	18.5	16.3

EXHIBIT 2

COMPARATIVE BALANCE SHEETS
LOCKHEED CORPORATION
As of December 31
($ Million)

ASSETS	1959	1958	1957
Cash	36.9	38.0	34.8
Receivables	181.6	118.5	89.1
Inventory	171.9	249.9	200.4
Advances	1.9	4.2	10.0
Prepaid Expenses	11.7	12.7	10.0
Investments	6.5	6.4	5.5
Notes Receivable	4.7	-----	-----
Net Plant & Equipment	72.6	63.7	61.1
Deferred R & D Costs	31.4	13.5	6.3
Other Deferred Costs	2.0	1.2	1.7
Total Assets	521.2	508.1	418.9
LIABILITIES			
Notes Payable	75.0	80.0	25.0
Accounts Payable	114.1	89.1	68.6
Taxes Payable	7.9	15.5	12.8
Accrued Liabilities	24.0	19.2	16.3
Other Liabilities	40.3	34.8	28.0
Advances	67.2	79.8	87.2
Debentures	41.8	48.3	58.1
Deferred Income	4.0	5.1	6.9
Capital Stock	7.2	3.1	2.9
Paid-In Surplus	47.3	41.7	32.3
Retained Earnings	92.4	91.5	80.8
Total Liabilities	521.2	508.1	418.9

EXHIBIT 3

EXPECTED LOSS BREAKDOWN 4/
(After Taxes)

ELECTRA PROGRAM:	
Modification of in-service aircraft	$ 11,441,000
Modification of production aircraft	11,774,000
Investigation of failure	1,241,000
	$ 24,456,000
JETSTAR PROGRAM:	
R & D and inventory write down	31,153,000
SUPERSONIC TRANSPORT PROGRAM:	
R & D	1,214,000
SUPER HERCULES PROGRAM:	
R & D	788,000
USED AIRCRAFT:	
Resale value write down	3,091,000
OTHER:	
Contract cost disallowances) Re-negotiation refunds) Income tax liabilities)	6,867,000
TOTAL EXPECTED LOSS (After Taxes)	$ 67,569,000

III. MANAGEMENT IN THE 1960s - CHALLENGE TO LOCKHEED AIRCRAFT CORPORATION

(Case #2)

Following a bravely executed write off of enormous losses in 1960, the Lockheed Aircraft Corporation began a new drive for corporate profits. With the death of Chairman Robert E. Gross in September 1961, leadership of the giant corporation fell to Courtlandt S. Gross, the late Chairman's younger brother. This shift in leadership also involved a change in managerial philosophy and style.

While Robert Gross was known to enjoy a rather flamboyant style of living which included fast sport cars, extravagant parties and modern art, his younger brother, Court, was of a different mold. The younger Gross preferred to drive a Volkswagen, entertained only modestly and wore a homburg.

As a manager, Court Gross believed in a participatory style with members of top management working as a team to achieve the decision-making process within the corporate structure. In sharp contrast to the elder Mr. Gross, the new Chairman of Lockheed believed in granting to subordinates the authority necessary to conduct their corporate affairs in an effective manner. Closer scrutiny of nuts-and-bolts costs was also another trait of the younger Mr. Gross.

Due to the contrasting leadership and managerial styles of the two men and the possible effects the change in top management might have upon the corporation, more than a few

individuals wondered whether Courtlandt Gross was up to the tasks which lay before him as the Chairman of Lockheed Aircraft Corporation. However, as if to allay any fears and doubts of his abilities, Mr. Gross announced in March 1962 that Lockheed had bounced back from the huge losses of 1960. He reported record profits of $26 million on record sales of $1.44 billion during 1961.

In what might have been considered an unwise or even heretical move by others of the aerospace industry, Lockheed decided to change the character of its product mix. The corporation chose to concentrate upon defense production rather than the more cyclical commercial aircraft market. This decision was made at a point in time when most defense contractors were searching for product lines which would reduce their dependency upon defense contracts for corporate profits.

Lockheed manned aircraft contracts, as well as its contributions to space exploration, were substantial. Seventy-five per cent of the total payload orbited by the United States had roared away from the launching pad aboard Lockheed-produced boosters. In 1961 alone, the Polaris Ballistic Missile program had brought the company $373 million in sales. During the same period, the P2V Neptune Antisubmarine Warfare Aircraft, the C-130 Hercules Transport and the F-104 StarFighter Interceptor contributed sales amounting to $459 million.

Future prospects were also bright due to the new emphasis by the Department of Defense upon the mobility of combat forces and the attendant requirement for rapid-response airlift capability. In March 1961 Lockheed was named the winner of a contract competition to produce the airlift capability and capacity of the future - the 158 ton, 550 m.p.h. Lockheed C-141 StarLifter. It was estimated that this contract award would be worth $1 billion in revenues to Lockheed during the 1960s.

In the eyes of other defense contractors, Mr. Gross and Lockheed were courting financial disaster by placing nearly three quarters of their eggs in the defense basket. However, Chairman Gross countered by arguing that defense was substantially less risky than commercial business. At the root of this belief was Mr. Gross's opinion that the risk of product development was appreciably reduced in the defense sector by the financial support of research and development by government contract. It was also suggested that certain technology spinoffs from federally-funded projects would occur and these would have application to products for the civilian market. Since the research and development costs for such knowledge would have been paid for by other than Lockheed, Mr. Gross opined that the company would save on such costs for its commercial ventures.

In an industry beset with uncertainties and huge financial risks, Lockheed enjoyed a reputation of being an innovative and imaginative company. Its contributions to

aviation and aerospace technology were a source of intense pride to Lockheed employees. This pride in past accomplishments and future prospects at times produced a heady euphoria which occasionally might mask other corporate facts of life. Lockheed had produced such exotic products as the U-2 spy plane, the A-11 Interceptor with a speed of over 2,000 m.p.h. and the supersecret replacement for the U-2, the SR-71. These projects had all emerged from Lockheed's renowned "Skunk Works" under the creative genius of Clarence "Kelly" Johnson. In addition to being famous for imaginative creativity, Lockheed was also known as a company which could readily make the product go from "think tank," to drawing board, to production. Thus, in 1964 a new idea came forth. Preliminary plans envisioned a rocket plane capable of carrying ten passengers and a crew of two between earth and an orbital space station. This "space shuttle" was to be operational by 1975. To back its claim of feasibility, Lockheed projected a round-trip "fare" of $11,700 per passenger and planned to use each vehicle for 500 round trips.

Buoyed by success in the aerospace and aircraft industries Mr. Gross set the company upon a course of diversification. Company engineers began building a $12 million dam in Wyoming, developed monorail mass transit systems and designed shipping containers which could be used in all modes of transport interchangeably. Additionally, Lockheed, one of the cornerstones of the aircraft industry, went to sea. The company began work on a 300-ton hydrofoil ship for

the Navy, an undersea exploration vessel and an emergency flotation system for the raising of sunken submarines. By making engineering changes and utilizing affective salesmanship, the company had even been able to turn one of its biggest losers - the Electra - into a profit. Sales to the Navy of a re-designed and modified Electra (dubbed the P-3A Orion) would bring Lockheed, at first estimates, sales of $100 million per year with continued sales of follow-on models assured.

In the area of labor relations, Courtlandt Gross was a man of strong principles. Faced with heavy pressure from the International Association of Machinists for a "union shop", Lockheed experienced costly strikes on four separate occasions rather than require union membership of its employees. Mr. Gross contended that each employee should be free to join the union if he so desired but by no means should an individual be forced into membership as a condition of employment. During early December 1962, Lockheed suffered a strike which, for 36 hours, brought company operations from Florida to Hawaii to a virtual standstill. Earlier in the same year, a presidential committee had recommended that the difficult issue of unionism be settled by a vote of the employees in each aerospace company. Although confident that Lockheed workers would cast their ballots against the institution of a "union shop," Mr. Gross was adamant in his opposition to such a vote. Mr. Gross's response to the committee's recommendation was simply that a person's right

to work was not something to be voted away. Gross's rejection of the committee's proposal brought official displeasure from the White House. President John F. Kennedy made no attempt to mask his displeasure with Courtlandt Gross's position and attitude. Informal pressures were applied in the form of thinly-veiled threats that such a recalcitrant attitude might affect existing and future government contracts for Lockheed. Courtlandt Gross stood his ground!

When the inevitable strike occurred at Lockheed in December 1962, the Administration was forced to alter its stand. A long labor shutdown at Lockheed (producer of vital defense systems such as the Polaris Ballistic Missile System and others) simply could not be tolerated. Consequently, President Kennedy was forced to invoke the provisions of the Taft-Hartley Law to keep the production lines at Lockheed humming. Under the provisions of the Taft-Hartley Law, an eighty-day "cooling off" period was provided for further negotiations between labor and management. In the face of such opposition the International Association of Machinists terminated the strike. Thus it appeared that Mr. Courtlandt Gross, in being true to his convictions, had won a battle over fundamental rights for the workers at Lockheed and had possibly set a precedent for labor relations within the aerospace industry. As if to validate Mr. Gross's stand, Lockheed workers eventually voted 85% in favor of a new contract which excluded any provisions for a "union shop."

Within Lockheed, over the course of several years, a change in managerial style and philosophy had taken place. With the death of Robert Gross the autocratic, Theory X style of management had apparently been replaced with the more participatory, Theory Y style of Courtlandt Gross. Does the decline during the latter 1960s and early 1970s of Lockheed indicate a failure of participatory management? Could Lockheed management have foreseen the problems which forced the company to the ragged edge of bankruptcy? Was Lockheed simply a victim of circumstances or could the management team have taken action to impede and possibly reverse the slide toward insolvency?

IV. LOCKHEED'S JETSTAR

(Case #3)

In August 1956, the Air Materiel Command (AMC) of the United States Air Force made a proposal to the aircraft industry for an industry-developed, small, high-speed transport. In its proposal, the Air Force expressed a willingness to forgo any specific military requirements in the aircraft. This was done in order to allow the companies a wide latitude in design in competing for sales of the aircraft to the Air Force. Such flexibility might make the plane readily marketable as a civilian executive craft and would certainly ease difficulties often encountered in the certification of military aircraft for civilian use. Travel time by executives, both military and civilian, was becoming increasingly important, and the time was right for a new generation of executive aircraft. This need was expressed on the military side by the Executive Director of the Air Force Association who said:

> "The other day, a good friend of mine - a major general in the Air Force - had business across the country from his station in Washington. His flight schedule called for a 20-hour elapsed time to destination. If an executive's time is worth thousands of dollars an hour - then we taxpayers have a reason to question his multi-thousand-dollar hike from coast to coast. His aircraft was that wonderful old clunker known to the military as a C-47...I have noted that the C-47, or DC-3, is a mainstay of the business fleet."

On the civilian side, the Office of Planning, Research and Development of the Civil Aeronautics Administration forecast:

> "Business and utility manufacturers have entered a golden decade that will see their sales more than triple to about $240 million annually in 1965."

A. IN THE BEGINNING...

Armed with knowledge that a specific requirement for the small, high-speed, executive transport existed and confident in its ability to produce such an aircraft, Lockheed entered the competition. From the drawing boards emerged a design labeled the L-329 which appeared to fill the bill. The L-329 was designed as a "ten (or more) place, swept-wing passenger plane" to be powered by four General Electric J-85 engines. The design called for an aircraft which would have a range of 2,000 miles and a speed of 525 m.p.h. (See Exhibit 1 for JetStar specifications.)

In touting its entry into the executive jet market, Lockheed was not at all modest. Mr. Hall L. Hibbard, Senior Vice President of Lockheed, said:

> "Actually, in passenger and crew comfort, and in aircraft performance, the L-329 compares with the large jet transports - at a fraction of the cost."

After engineers in Burbank, California and Marietta, Georgia, had decided upon the final configuration of the L-329, the project was turned over to Mr. C. L. "Kelly" Johnson who personally supervised the building of prototypes. ("Kelly" Johnson was the creative genius behind Lockheed's renowned "Skunk Works," which produced many of Lockheed's most exotic aircraft.) This work commenced in February 1957, with the first flight scheduled for September of the same year. In

the words of Mr. Hibbard, "...there never was any question of making it."

Mr. Hibbard's confidence was certainly justified as the new aircraft moved from preliminary drawings to flight in a mere 241 days. The Lockheed entry was the first to fly, and it appeared that Lockheed's chances of winning a lucrative production contract were, indeed, excellent. (See Exhibit 2 for JetStar timetable.) Of the twenty-eight companies which received the Air Materiel Command's proposal in August 1956, eight firms were known to be seriously at work on the project. These eight firms were: Lockheed; North American; Fairchild; Beech; Cessna; Temco; McDonnell; and Northrup. At the time of the original Air Force proposal the Air Materiel Command had stated that an approximate requirement for 1000 - 1500 twin-jet aircraft and 200 - 300 four-jet aircraft over a procurement period of five to seven years was envisioned. If Lockheed could capture this contract, as well as a sizeable share of the expected civilian market, the L-329 would certainly be a profitable venture.

Even though Lockheed's entry (now officially known as the CL-329 JetStar) was the first "new" aircraft to fly, there existed several alternative aircraft to be considered by the Air Force. North American's twin-jet Sabreliner was scheduled to fly in March 1958. The Sabreliner design was for four passengers plus a crew of two with a high density seating option which increased the passenger load to nine. Fairchild, with its four-engined model, the M-185F, had

already sold aircraft to Continental Can Company and Continental Oil Company with expected delivery in 1960. The Beech Aircraft Company offered an aircraft which was available immediately. The company had an option to build, under license, the French-made Morane Saulnier MS-760 at its Wichita plant. The only factor holding up production was an absence of orders to make production worthwhile. Cessna, long a producer of aircraft for the general aviation market, was developing a four-seat version of its T-37A primary jet training aircraft. This aircraft, already in use in large numbers by the Air Force in the training of student pilots, offered the service the advantages of commonality. If the Cessna entry could satisfy the mission requirements of the Air Materiel Command as an executive transport and mission support aircraft, logistic support of the aircraft would certainly be less costly due to commonality with the T-37A. The other firms working on entries were in various stages of development but were generally well behind Lockheed, North American, Fairchild, Beech and Cessna.

In addition to the expected sales to the Air Force, interest existed within the Navy for an aircraft which would perform the same functions as the Air Force model. "Kelly" Johnson of Lockheed was confident the JetStar could "easily" be modified to withstand the rigors of launch and recovery aboard an aircraft carrier.

In January 1959, Lockheed decided to market the JetStar in only the four-jet configuration. This decision was

apparently motivated by the rather poor performance of the twin-jet version when operating on a single engine at high gross weights. Other than this decision on engine configuration, the JetStar appeared to meet satisfactorily all requirements of the Air Force, both for utility and performance. Indeed, the aircraft had successfully demonstrated in the twin-jet configuration its adaptability to a number of various missions. The decision to market the four-jet version only enhanced the reliability and performance specifications of the JetStar. In addition to the JetStar's anticipated role of VIP transport, the aircraft could be utilized as a flying classroom for navigators and bombardiers, as a tow for gunnery targets, as a reconnaissance and electronic warfare platform and as a small cargo aircraft.

Lockheed was named the winner of the competition by the Air Force in October 1959, and five aircraft were ordered in June 1960. The first of these five JetStars was delivered in April 1961, and Lockheed's hopes were high that continued deliveries would be made on schedule. It certainly appeared that Lockheed's early hopes for the JetStar were beginning to materialize.

B. REALITY COMES HOME TO ROOST

In January 1962, it was reported that Lockheed faced a possible $80 million before-tax loss on the JetStar. Lockheed had spent about $100 million developing the aircraft and needed to sell at least 300 to break even on the program. As of the beginning of 1962 a total of 43 aircraft

had been sold to all customers. At the time, total orders from the Air Force were 16, and Lockheed expected to halt production later in 1962 unless new orders were forthcoming. Of the $80 million loss estimated by Lockheed, $65 million had been written off and $10 million had been consumed in administrative costs. It was hoped that the remaining $5 million could be recovered by future sales of the JetStar.

The JetStars ordered by the Air Force were all to be assigned to the 1254th Air Transport Wing at Andrews Air Force Base near Washington, D.C. Of the sixteen, five were to be utilized for flight-checking aids to navigation, five, having convertible interiors, were to be used for mission support, and the remaining six were to be assigned the VIP transport role. Congressional records show that through 1962 the Air Force had been authorized funds to buy approximately 30 to 35 JetStars. (See Exhibit 3 for funding and expenditure breakdown.)

According to Lockheed Chairman, Robert Gross, who had died in 1961, the failure of the Air Force to buy JetStars in the number originally anticipated was due to several factors. The emphasis placed upon missiles and space projects by the Eisenhower Administration plus the de-emphasis of manned aircraft during the period both drained funds away from the JetStar. In addition, funds which were available for the procurement of manned aircraft were being appropriated for tactical rather than mission-support aircraft. The market for civilian executive transports, or at least

Lockheed's share of that market, failed to meet Lockheed's forecasts. This placed the attainment of the break-even point on the JetStar even further from Lockheed's grasp.

In a further attempt to sell the JetStar, Lockheed sought to interest purchasers of the F-104 StarFighter in the aircraft. Lockheed contended that the JetStar, equipped as a flying classroom, could be utilized in the training of F-104 pilots. The F-104 aircraft, with its highly sophisticated radar and weapons-delivery systems, was a difficult aircraft, at best, in which to become proficient. By utilizing the JetStar to train pilots in the use of these sophisticated sub-systems, training time and funds could be saved due to the multiplace configuration of the JetStar. In this way, several pilots could be trained simultaneously with the added advantage of an on-site instructor. Several JetStars were sold to Allied operators of the F-104. However, the total number of such sales was insignificant in relation to the number required for Lockheed to attain the break-even point.

C. OPTIMISM SPRINGS ETERNAL

Robert I. Mitchell, who was assigned to JetStar sales on a full time basis, hung on to the belief that the Air Force still needed about 300 JetStars for mission support requirements. According to Lockheed, the Air Force was being offered an aircraft which they could hardly refuse since the JetStar justified itself on cost savings alone. Lockheed stated that the JetStar, when used in the mission-support

role at an operating cost of 42¢ per nautical mile, was more economical than aircraft currently being used to support the many missions of the service. The company stated that the cost of operating a JetStar was 26% less than a Douglas C-47, 29% less than a Convair C-131 and 47% less than a Douglas C-54. (See Exhibit 4 for operating costs of the JetStar.)

According to Lockheed beliefs, the failure of the civilian market to materialize was due to a lessening of corporate desire to purchase aircraft solely for prestige purposes. However, the company felt that once enough JetStars were in service, discussion of the aircraft's capabilities by professional pilots would cause the plane to start selling itself on reputation. It was also felt by Lockheed that corporate chief pilots would be reluctant to vote against the acquisition of swift corporate jets. At the root of this belief was Lockheed's opinion that such a negative vote by chief pilots would lead to increased use by corporate executives of regularly scheduled airlines. This, in turn, would decrease the requirement for corporate pilots. It was Lockheed's conviction that corporate pilots were not about to vote themselves out of a job. As a result, Lockheed expected JetStar sales to increase and become self-sustaining.

QUESTIONS:

1. What factors other than those discussed in the case material, both within Lockheed and external to the company, might have contributed to the downfall of the JetStar?

2. How might Lockheed have avoided the large financial loss which it incurred?

3. Was Lockheed management to blame or was the company a victim of circumstance and the times?

EXHIBIT 1

JETSTAR DIMENSIONS

and

MISSION PERFORMANCE SPECIFICATIONS

Wing Area	532 sq. ft.
Wing Span	53'8"
Length	58'10"
Height	10'6"
Fuselage diameter (outside)	85"
Head room	74"
Cabin length	257"
Seat spacing	40"
Crew/passengers	2/10
Max. density seating	22
Max. litter capacity	12

Takeoff gross weight	28,872 lb.
Fuel weight	10,894 lb.
Range	1,550 N.M.
Max. cruise altitude	45,000 ft.
Cruise Mach	.77
Takeoff field length	3,760 ft.
Landing speed	88 Kt.
Landing field length	5,550 ft.

EXHIBIT 2

JETSTAR TIMETABLE

August 1956	Air Force issued requirement for jet utility transport (UCX) with 8 - 10 passenger capability to be developed at industry's expense.
January 1957	Building of prototype started at Lockheed's California Division in Burbank.
September 1957	JetStar (powered by twin Bristol Orpheus Turbojets) made 35 min. first flight at Edwards Air Force Base, California.
February 1958	Phase 2 testing completed by Air Force.
November 1958	Production of standard aircraft started at Lockheed-Georgia Co. in Marietta.
January 1959	Pratt & Whitney JT12A Turbojet selected to power JetStar; decision made to market aircraft only in four-engine configuration.
October 1959	Air Force named JetStar winner of UCX competition.
June 1960	Air Force ordered first five JetStars to check navigation aids in ATC system.
April 1961	First Air Force JetStar delivered by Lockheed.
August 1961	Federal Aviation Agency issued 4B Transport Category-Type Certificate to JetStar and granted Lockheed-Georgia Co. production certificate.

EXHIBIT 3

JETSTAR

AIR FORCE EXPENDITURE BREAKDOWN 5/

($ millions)

FISCAL YEAR	REQUESTED	APPROPRIATED	OBLIGATED
1959	21.8	21.8	8.8
1960	23.4	23.4	0.0
1961	0.0	0.0	12.0
1962	19.1	10.0	10.0
	64.3	55.2	30.8

EXHIBIT 4

JETSTAR DIRECT OPERATING COSTS - DOLLARS PER FLYING HOUR

ITEM	BASIS	ANNUAL UTILIZATION-HOURS 400	600	800
FIXED COSTS:				
Crew Salary	$32,000 annual total for pilot & co-pilot plus 22.5% for fringe benefits	$ 98.00	65.30	49.00
Insurance	1.75% for hull & public liability based on purchase price of $1,700,000	72.50	48.30	36.25
TOTAL FIXED COSTS (without depreciation)		$170.50	113.60	85.25
VARIABLE COSTS:				
Fuel	$0.30/gal, 1200 S.M.	132.00	132.00	132.00
Oil	$12.00/gal, .026 gal/hr	.31	.31	.31
Airframe & Engine Maintenance	5.0 manhours/flt hr; $4.50/labor hr	22.50	22.50	22.50
Airframe & Engine Maintenance Material		21.25	21.25	21.25
Reserve for Engine Overhaul	$12,400 per engine per overhaul; 1400 hrs between overhauls	35.40	35.40	35.40
TOTAL VARIABLE COSTS		$211.46	211.46	211.46
TOTAL OPERATING COSTS		$381.96	325.06	296.71
ACTUAL COST TO CORPORATION (48% Tax Bracket)		$198.62	169.03	154.29

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